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## FULL SYLLABUS DEMO TEST : (CS) - REPORTS

OVERALL ANALYSIS   COMPARISON REPORT   **SOLUTION REPORT**

ALL(65)   CORRECT(43)   INCORRECT(14)   SKIPPED(8)

Q. 21

Have any Doubt ?



$\lim_{x \rightarrow 0} \left( \frac{4e^{4x} - 4}{\sin(2x)} \right)$  is equal to \_\_\_\_\_

**A** 8

Your answer is Correct

Solution :  
(a)

$\lim_{x \rightarrow 0} \left( \frac{4e^{4x} - 4}{\sin(2x)} \right)$  it is of form  $\left( \frac{0}{0} \right)$

Applying L Hospital's rule

$$\begin{aligned} \lim_{x \rightarrow 0} \frac{16e^{4x}}{2 \cos(2x)} \\ = \frac{16}{2} = 8 \end{aligned}$$

**B** 16

**C** 4

**D** Limit does not exist

QUESTION ANALYTICS



Q. 22

Have any Doubt ?



Consider the following CFG:

$S \rightarrow (L) | aL$

$L \rightarrow SL' | b$

$L' \rightarrow x SL' | \epsilon$

Which of the following represents FOLLOW(L) and FIRST(L)?

**A** FOLLOW(L) = { }, \$  
FIRST(L) = { a, b }

**B** FOLLOW(L) = { x , }, \$  
FIRST(L) = { (, a, b }

Your answer is Correct

Solution :

(b)

- FOLLOW(L) = { }, FOLLOW(S)
- FOLLOW(S) = FIRST(L') = { x , FOLLOW(S) } = { x , \$ }
- FOLLOW(L) = { }, x , \$
- FIRST(L) = [FIRST(S), b]
- FIRST(S) = { (, a }
- FIRST(L) = { (, a, b }

**C** FOLLOW(L) = { }, \$  
FIRST(L) = { (, a }

**D** FOLLOW(L) = { x , }, \$  
FIRST(L) = { (, a, b, \epsilon }

QUESTION ANALYTICS



Q. 23

Have any Doubt ?



An AVL tree is constructed by inserting the following sequence of elements into empty AVL tree. After building AVL tree, if an root element is deleted from it and after stabilizing of AVL again root element is deleted then which of the following represent the preorder of resulted AVL tree (replace root by using inorder predecessor)?  
17, 14, 19, 16, 15, 18, 13

A 13, 14, 15, 18, 19

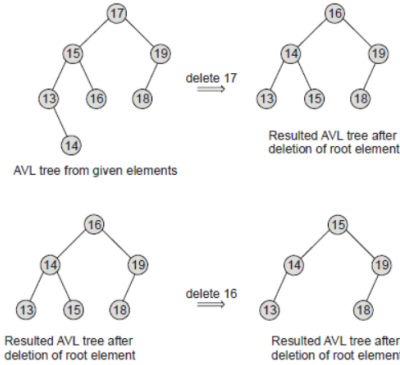
B 13, 14, 18, 19, 15

C 16, 13, 14, 19, 18

D 15, 14, 13, 19, 18

Your answer is Correct

Solution :  
(d)



QUESTION ANALYTICS

+

Q. 24

Have any Doubt ?

+

A bag contains 40 tickets numbered 1, 2, 3, ..., upto 40. Among them 4 are drawn at random and arranged in ascending order  $t_1 < t_2 < t_3 < t_4$ . The number of possible order when  $t_3$  being 25 are \_\_\_\_\_.

4140

Your answer is Correct 4140

Solution :  
4140

Assume  $t_3$  is 25. There are 24 cards preceding 25.

$t_1$  and  $t_2$  can be chosen from these 24 cards  ${}^{24}C_2$  ways.

$t_4$  should be greater than 25.

Number of such cards = 15

$\therefore$  Number of ways of choosing  $t_4 = {}^{15}C_1$

$\therefore$  Favourable outcomes =  ${}^{24}C_2 \times {}^{15}C_1 = 4140$

QUESTION ANALYTICS

+

Q. 25

Have any Doubt ?

+

Consider the following relational schema:

$R(A, B, C, D, E, F, G, H)$  with FD set  $\{AB \rightarrow C, AC \rightarrow B, AD \rightarrow E, B \rightarrow D, BC \rightarrow A, E \rightarrow G\}$  the following relations are sub relations of the relation R.

1.  $R_1(A, B, C)$

2.  $R_2(A, B, C, D)$

3.  $R_3(A, B, C, E, G)$

The number of sub relation are in BCNF \_\_\_\_\_.

1

Correct Option

Solution :  
1

$R_1(ABC)$	$R_2(ABCD)$	$R_3(ABCEG)$
FD set	$\{AB \rightarrow CD\}$	$AB \rightarrow CEG$
$AB \rightarrow C$	$BC \rightarrow AD$	$BC \rightarrow AEG$
$BC \rightarrow A$	$AC \rightarrow BD$	$AC \rightarrow BEG$
$AC \rightarrow B$	$B \rightarrow D$	$E \rightarrow G$
BCNF	Not BCNF	Not BCNF

Your Answer is 2

QUESTION ANALYTICS

Q. 26

Have any Doubt ?



A non-pipelined processor has a clock rate of 4 GHz and an average CPI of 5. An upgradation to the processor introduced a six stage pipeline. However due to internal pipeline delays the clock rate of the new processor has to reduced 2 GHz. Then the speed up is \_\_\_\_\_. (Upto 1 decimal)

2.5 [2.3 - 2.7]

Your answer is Correct 2.5

Solution :  
2.5 [2.3 - 2.7]

$$\text{Cycle time} = \frac{1}{\text{Frequency}}$$

$$ET_{\text{nonpipe}} = \text{Avg CPI} \times \text{Cycle time}$$

$$= 5 \times \frac{1}{4 \times 10^9} = \frac{5}{4} \text{ nsec}$$

$$= 1.25 \text{ nsec}$$

$$ET_{\text{pipe}} = \text{Avg CPI} \times \text{Cycle Time}$$

$$= 1 \times \frac{1}{2 \times 10^9} = 0.5 \text{ ns} \quad (\because \text{Avg CPI of pipeline} = 1)$$

$$\text{Speedup} = \frac{ET_{\text{nonpipe}}}{ET_{\text{pipe}}} = \frac{1.25 \text{ nsec}}{0.5 \text{ nsec}} = 2.5$$

QUESTION ANALYTICS

Q. 27

Have any Doubt ?



Consider the following recursive function which is used by dynamic programming:

$$T(n) = \begin{cases} 0; & \text{if } n < 1 \\ 1; & \text{if } n = 1 \\ T(n-1) + T(n-2) + 1; & \text{if } n > 1 \end{cases}$$

Assume for every function call  $T(i)$  it checks the table first, if its value is already computed it retrieves the value from table. Otherwise it calls a recursive function call to compute its return value. Whenever a function  $T(i)$  computes for first time its return value is stored in the table to avoid the redundant function calls. If system allocated 48 bytes for stack allocation, then the maximum value of 'n' so that overflow cannot occur \_\_\_\_\_.  
(Assume system allocate 4 byte to each stack entry which is sufficient for storing required data.)

12

Correct Option

Solution :

12

Given recurrence relation calculate Fibonacci number, with dynamic programming we can calculate each function call only one time so maximum number of function call before stack overflow:

$$48 = n \times 4$$

$$n = 12$$

Your Answer is 21

QUESTION ANALYTICS

Q. 28

Have any Doubt ?



The eigen value of matrix  $A = \begin{bmatrix} 4 & 1 & 2 \\ 17 & 2 & 1 \\ 14 & -4 & 10 \end{bmatrix}$  correspond to eigen vector  $\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$  is \_\_\_\_\_.

12

Correct Option

Solution :

12

We know that,  $AX = \lambda X$


Here X is eigen vector

$$\text{So, } \begin{bmatrix} 4 & 1 & 2 \\ 17 & 2 & 1 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix} = \lambda \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$$

$$\begin{bmatrix} 14 & -4 & 10 \end{bmatrix} \begin{bmatrix} 3 \end{bmatrix} = \begin{bmatrix} 3 \end{bmatrix}$$


$$\begin{bmatrix} 12 \\ 24 \\ 36 \end{bmatrix} = \lambda \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$$

i.e.  $\lambda = 4 + 2 + 6$   
 $\lambda = 12$

 QUESTION ANALYTICS



Q. 29

 Have any Doubt ?



Consider four process (process id 0, 1, 2) with burst time 2, 4, 6 times units. All processes are arrive at time zero. Consider the longest remaining time first scheduling. In LRTF ties are broken by following highest process id. The average waiting time is \_\_\_\_\_. (Upto 1 decimal places)

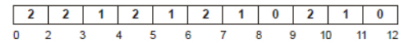
7.0

Your answer is Correct 7.0


Solution :

7.0

Gantt chart using LRTF:




Process id	Burst Time	Completion	TAT	W.T.
0	2	12	12	10
1	4	11	11	7
2	6	10	10	4
Average W.T. = 21/3 = 7				

 QUESTION ANALYTICS



Q. 30

 Have any Doubt ?



The characteristics of RISC architecture is/are

☒ A Relatively few instructions.

Your option is Correct

☐ B Relatively more addressing modes.

☒ C Use of overlapped register windows to speed-up procedure call and return.


Your option is Correct

☒ D Memory access limited to load and store instructions.

Your option is Correct


YOUR ANSWER - a,c,d

CORRECT ANSWER - a,c,d

STATUS - 

Solution :

(a, c, d)

 QUESTION ANALYTICS

